Coal Mining

Teacher's Introduction to Coal Mining

Coal Mining Issues Affect Us All

Coal production is one of Kentucky's leading industries. In 1990, our state produced 179.4 million tons of coal, ranking the Commonwealth second in the nation for coal production. Since 1976, more than one million of Kentucky's 26 million acres of land have been permitted for mining. Currently there are about 3,000 mine operations active in Kentucky. About 75% of these mine sites are located in Eastern Kentucky.

The environmental impacts of coal mining are better controlled since Congress passed the federal Surface Mining Control and Reclamation Act in 1977. The act requires coal operators to reclaim the lands they mine and control pollutants that run off mined sites. Stepped-up enforcement of state surface mining laws has also resulted in a significant decrease in illegal mining over the past 10 years.

However, much remains to be done to reclaim the 90,000 acres of old abandoned mine lands and to minimize environmental damage from active coal mines. Coal mine blasting is a serious public concern as well and has been the topic of much debate in Kentucky during recent years. Kentucky leads the nation in the use of explosives, primarily due to coal mining activities. Nearly 1,500 citizen complaints regarding mining activities were received by the state during 1990. Most alleged damage to private drinking water wells.

The following activities will provide your students an opportunity to learn more about our coal resources, its economic importance to the state, the environmental problems associated with coal mining, and what is being done to minimize the environmental impacts of mining in Kentucky.

ν Where to Get Information

The "State of Kentucky's Environment" report contains an analysis of statewide and regional coal mining trends and current conditions, including coal production, environmental impacts, compliance, and more. Additional information is also provided in other chapters including Water Resources and Energy. Check the index in the report for general information and the expanded index in the Appendix of this guide to find a list of all the references to your county and region.

ϖβ Overview of Student Activities

Activity 1: **Coal Mining Facts**

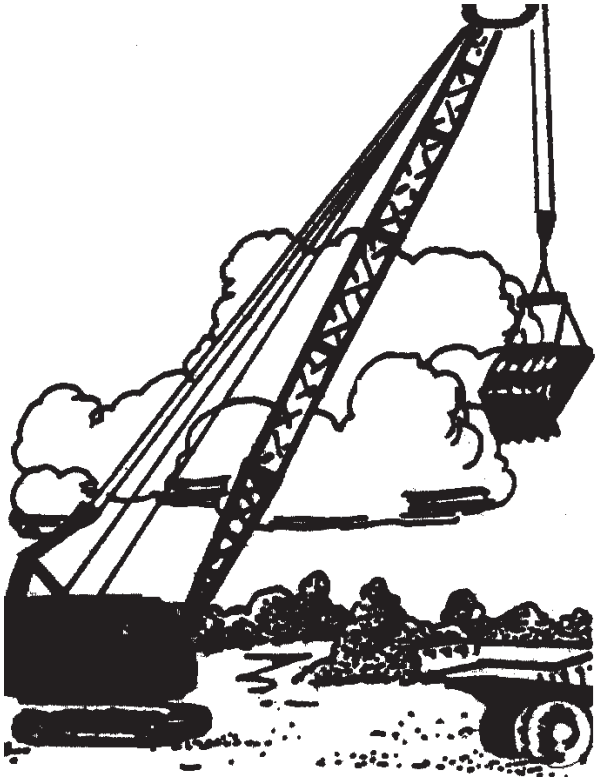
Your students will become more familiar with coal production and its importance in the state. Students will use math skills to assess present and future coal production rates, coal reserves, and mining techniques. Students will also review the environmental problems associated with coal mining in Kentucky.

Activity 2: Coal Mining Regulation in Kentucky

This activity will help students understand the democratic process in action. They will examine the role state and federal laws and regulations play in protecting public welfare and the environment from mining impacts. Students will also learn why the federal Surface Mining Control and Reclamation Act of 1977 was passed and how Kentucky carries out its provisions. Student groups will research and prepare historical re-enactments based on their findings.

Activity 3: Environmental Costs Versus Benefits of Coal Mining

This activity will help students understand the conflicts that sometimes occur between development and the environment. A class discussion regarding the pros and cons of mining under Lilley Cornett Woods - a 500-acre old-growth forest - will serve as the topic of discussion. Students will examine the importance of working together to resolve conflicts.



Activity 1: Coal Mining Facts

Instruction Sheet

DO YOU KNOW:

- How much coal is mined each year in Kentucky?
- Which region of the state produces the most coal?
- The role coal plays in our day-to-day lives?

State Among Top Coal Producers in the Nation

Coal production is a major industry in our state. It is our primary energy source providing much of the electricity we use. The extraction of coal employs thousands of Kentuckians, and is a source of tax revenue to fund state and local economic and social programs.

The benefits of coal are numerous, but coal mining has also caused some serious environmental problems in Kentucky. Concern about irresponsible coal mining led Congress to pass the federal Surface Mining Control and Reclamation Act of 1977. The enforcement of this law has helped minimize pollution from minesites, ensured proper reclamation of these areas once mining was complete, and reduced the occurrence of wildcat mines, which are illegal and unpermitted mines once common in Kentucky.

While progress has been made, more remains to be done to reclaim thousands of acres of abandoned mine sites in the state and continually monitor the 3,000 coal mining operations that are active in Eastern and Western Kentucky.

Coal Deposits Formed 300,000 Million Years Ago

Coal deposits of Eastern and Western Kentucky were formed during the same period, about 300,000 million years ago. Geologists estimate it took about five to eight feet of rotted plants to make one foot of coal.

Kentucky's coal resources are contained in two distinct geological basins where numerous coal seams lie one over the other, separated by sandstones, shales, and limestone. Each coal bed is a product of very special geological conditions that allowed the plant materials to be buried and preserved.

The Kentucky Geological Survey estimates the state's mineable coal reserves are 105 billion tons - 63 billion tons in the Eastern Kentucky coal fields located within the Central Appalachian Geological Basin, and 42 billion tons in Western Kentucky coal fields located within the Interior Geological Basin. The amount of coal in the U.S. is estimated at 180 billion tons, almost one-quarter of the world's total supply. More than *half* the U.S. coal supply is located in Kentucky.

Some types of coal are more desirable than others based on its energy content. Coals are ranked according to the amount of carbon they contain, which determines the amount of energy or heat (Btu) they produce. Kentucky produces bituminous coal, also called soft coal, ranging in energy value from 13,000 Btu to over 15,000 Btu per pound. The coal in Eastern Kentucky is generally higher in Btu value than Western Kentucky coal.

Another factor that may impact the future use of Kentucky coal is sulfur content. Eastern Kentucky coal is relatively low in sulfur content, while coal mined in the western part of the state generally has a high sulfur content. The burning of high sulfur coal in power plants has been linked to the formation of acid rain.

The air pollutants released by coal burning power plants in Kentucky, Ohio, and Pennsylvania are carried far upwind to the North where they form acid rain. Acid rain is impacting lakes in Canada and the Northeastern United States. Recent federal efforts have focused on controlling the air pollutants linked to acid rain.

Because of the economic importance of coal in Kentucky as well as our reliance on it for energy it only makes sense that we become more familiar with its production as well as the role is plays in our lives.

Purpose:

This activity will help familiarize you with coal production trends and issues in our state. You will use your math skills to assess present and future production rates, coal reserves, and review mining techniques.

Procedure:

Instructions continued

Part 1 - Coal Mining Facts in Kentucky
Obtain Worksheet #1 from your teacher. Review, discuss, and answer questions.

Part II - Investigating the Changes in Coal Mining
1. Prepare a report on the following:
   A. Research what type of coal is found in Kentucky compared to other coals in the U.S. as well as the differences in coal found in the two geologic basins located in Kentucky (carbon, sulfur, and ash content, etc.).
   B. Research the various coal mining techniques used in Kentucky to determine why there has been a shift from surface coal mining to underground mining.
2. Summarize your findings and present them to the class.

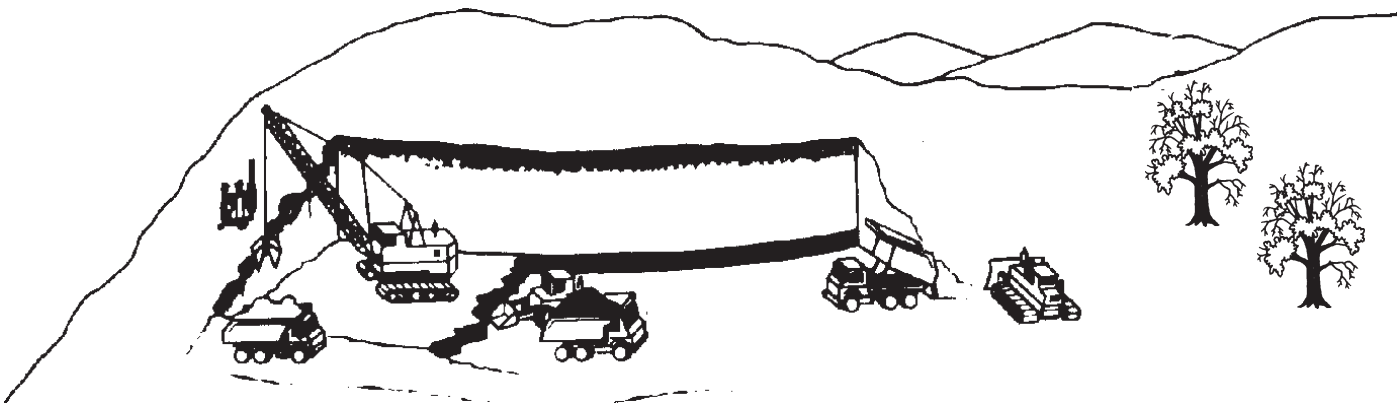
Part III - The Future of Coal Mining in Kentucky
1. As a class discuss the importance of coal in Kentucky and what factors may influence its future production and use. Also discuss your community's local economy, the role our natural resources play in sustaining it, and factors that may influence economic changes in your community.
2. Clip newspaper articles concerning coal mining and other economically important sectors in the state (agriculture, tourism, etc.) and post articles on a bulletin board. Discuss these articles periodically and review how Kentucky's economy may change over the next 20 to 30 years.

Other Activities:

1. Tour a mine site.
2. Read the book "Night Comes to the Cumberlands" by Harry Caudill and summarize your reaction to the book.
3. Create a class chart that tracks coal production trends in Kentucky. Challenge future classes to continue to plot coal production trends in Kentucky.
4. Invite a person to class who has mined coal or is from an area dependent on coal mining jobs. Discuss the importance of coal in Kentucky and how mining technologies have changed.

References/Additional Resources:

1. The Kentucky Department of Mines and Minerals can provide yearly production and mining data on coal production. Contact the department at P.O. Box 14080, 3572 Iron Works Pike, Lexington, KY 40512-4080, 606-254-0367.
2. To find out more about coal mines in your area and how to schedule a tour of a coal mine contact the KY Department of Surface Mining, #2 Hudson Hollow, Frankfort, KY 40601, 502-564-6940.



Activity 1. Coal Mining Facts

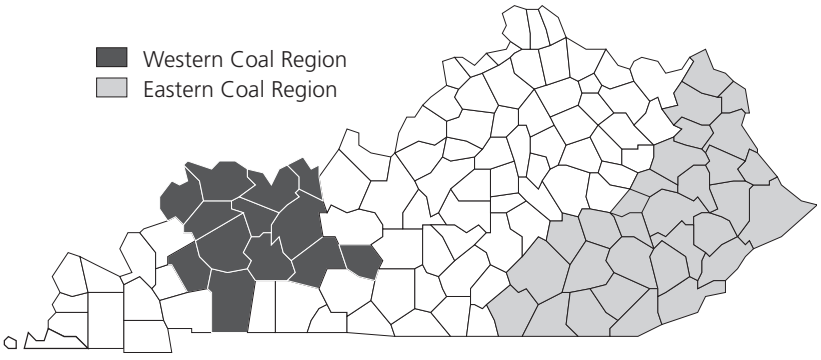
Worksheet #1

Coal Production Contributes Significantly to Kentucky Economy

To understand the environmental issues associated with coal mining, it is necessary to review some facts and trends pertaining to the mining of coal in the state:

- **Coal Production at Record Levels**
  In 1990, Kentucky produced a record 179.4 million tons of coal.
- **Differences in East and West Kentucky Coal**
  Kentucky is unique in that it is the only state with coal production in two of the nation's three major coal basins. The Eastern Kentucky Coalfield lies within the Central Appalachian Basin, while the Western Coalfield is located in the Interior Basin (Figure 1). The differences in the geologic formations of these two basins result in coal that is different in quality, with Eastern Kentucky coal having a higher energy or Btu value and lower sulfur content. Eastern Kentucky now produces a majority of the state's coal. During the last 12 years, production of coal in this region has steadily increased (Figure 2). Western Kentucky coal production increased from 40 million tons in 1978, to 48 million tons in 1990.
- **Recoverable Coal Resources Estimated at 29.9 Billion Tons**
  Bituminous coal resources in the state are estimated at 105 billion tons. Presently, 29.9 billion tons of coal are classified as recoverable. Approximately 3.2 billion tons have been mined in Western Kentucky and 8.5 billion tons have been extracted in Eastern Kentucky.
- **Underground Mining Steadily Increasing**
  The mining of coal by underground mining techniques has been increasing in the state since 1983 (Figure 3). It now replaces surface mining as the most used method to extract coal in Kentucky.
- **Coal Employment Decreasing**
  While coal production continues to increase, mining employment in Kentucky has declined steadily, from 50,806 jobs in 1981, to 31,486 in 1989. This decrease is due to advancements in mining technology and the increased use of highly mechanized mining equipment.

Figure 1
Major Coal Producing Counties



Source: Kentucky Department for Surface Mining Reclamation and Enforcement, 1991

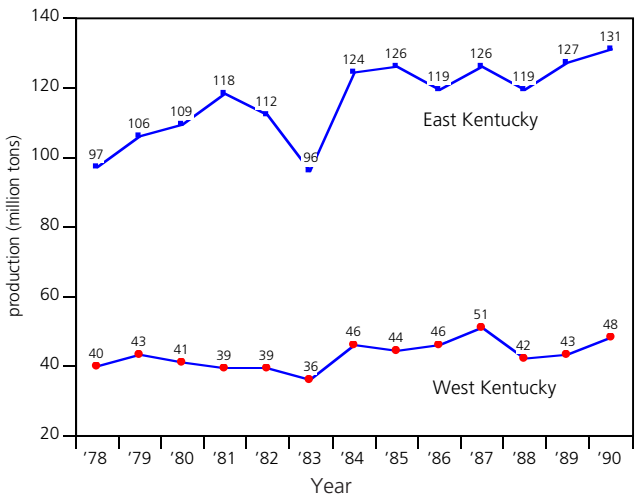
Worksheet #1 continued

◆ **Ten Firms Control Nearly Half of Coal Reserves in Kentucky**

Ten companies control nearly half of the state's estimated $1.2 billion in coal supplies. The ten companies are an even mix of landholding companies and mining firms and are mostly headquartered outside of Kentucky.

Figure 2

Regional Coal Production in Kentucky



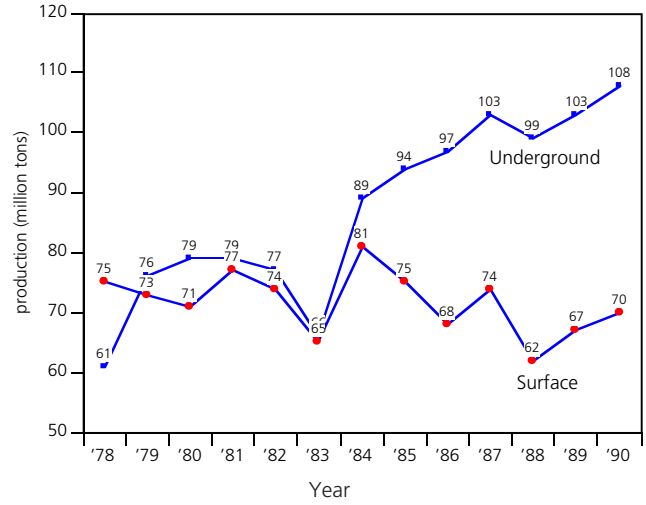
Source: Kentucky Department of Mines and Minerals Annual Reports

Questions ?

1. Why is coal important to Kentucky?
2. What is the percent change in total coal production in Kentucky for 1978 and 1990?
3. Based on the fact that 29.9 billion tons of coal is classified in Kentucky as recoverable determine how many years it will take to exhaust coal supplies in Kentucky using the 1990 total coal production rate in Figure 2.
4. Project coal production in Eastern and West ern Kentucky for the next 10 years, based on the trends you see in Figure 2.

Figure 3

Coal Production Trends in Kentucky



Source: Kentucky Department of Mines and Minerals Annual Reports

What You Can Do . . .

1. Conserve energy. Most of Kentucky's electricity is generated by coal-burning power plants. Reducing your use of electricity will reduce our need for coal and conserve supplies for the future and beyond.
2. Read the local newspaper of largest distribution to monitor coal mine activities in your area. Companies must run ads to notify the public when applying for a permit to mine coal, when blasting occurs, and for other mining-related activities.

Activity 2. Coal Mining Regulation in Kentucky

Instruction Sheet

D0 YOU KNOW?

- How one person's actions resulted in the passage of stricter coal mining regulations in Kentucky?
- How many mines are currently operating in the state?
- How many abandoned mine lands still continue to pollute our environment?

Progress Made in Regulating Coal Mining Abuses

In 1965 Ollie Combs (known as Widow Combs to her friends) laid down in front of a bulldozer that was about to begin mining her property because she feared it would cause dirt and debris to tumble onto her Honey Gap home. For her efforts, she was carried bodily by the police from the scene . "I've never been in trouble, never been in jail. I just want to live out my life in my hollow and be left alone," the 61 year old widow told the judge, before he sentenced her to 20 hours in the Knott County jail.

Her resistance gained front page recognition across the state and the nation. A few months later, then-Governor Ned Breathitt pushed tough strip mine legislation through the 1966 General Assembly.

However, enforcement of the legislation was not effective. Efforts to pass new legislation took place in 1972, when the governing bodies of two Kentucky mountain counties called for an end to all surface mining due to the environmental and human impact it was having on the region.

While this effort failed, the national Surface Mining Control and Reclamation Act was passed by Congress in 1977. The act called for strict regulation and enforcement of surface mining and reclamation practices to prevent the abuses caused by the virtually unregulated industry. (Excerpted with permission from "The Widow Combs, 60s Strip-Mining Figure, Dies," by Richard Wilson - Courier Journal 2/26/93).

Kentucky was granted authority to carry out the federal surface mining act in 1982 and has since issued thousands of "permits" used to regulate the mining of coal and ensure the land is properly reclaimed.

However, thousands of acres of abandoned mine sites are still polluting the environment. Progress has been slow to reclaim many of these sites. And the challenge to monitor 3,000 active coal mine sites is great.

Purpose:

In this activity you will observe the democratic process in action and the role laws and regulations play in protecting public welfare and the environment. You will also investigate why the federal Surface Mining Control and Reclamation Act of 1977 was passed by Congress and how Kentucky carries out its provisions.

Procedure

Part I - Coal Mine Regulation in Kentucky

1. Obtain Student Sheet #1 from you teacher. Review, discuss, and answer questions.

Part II- Tracing the History of Coal Mining in Kentucky

1. Divide into 4 groups. Each group will be assigned one of the following topics to research. The emphasis of your research should be on the key actors and their roles since you will be putting together a historical re-enactment of the regulation of surface mining in Kentucky. Remember, all perspectives (industry, landowner, environmental group, regulator, lawmaker) are important.

   Team A.- Investigate how mining impacted Kentucky in the 1960's and 1970's. Research newspapers and other sources to determine how mining impacted people's lives and the environment during this time and what actions took place to bring about changes in the way coal mining is regulated.

   Team B - Investigate the national legislative process and how the federal Surface Mining and Reclamation Act of 1977 was passed. Look at both the procedural process (how a bill becomes law) as well as the issues and debate that occurred. Historical information on the law is available at local libraries and, again, look for old newspaper articles to get both a national and state perspective. Also contact your U.S. congressional representative and request information about Kentucky's role in the passage of the law.

Instructions continued

Team C - Investigate state legislative and regulatory processes in carrying out the federal Surface Mining Act of 1977. Research why and how Kentucky decided to carry out the federal law itself. Identify key legislators, citizens, and industry groups involved in the state passage of coal mining laws and regulations and what role they played.

Team D - Research key provisions of state surface mine laws and regulations in Kentucky and the role of the executive, legislative, judicial branches of government play in carrying them out. What is the role of the public and how do we ensure the laws and regulations are being properly carried out? Also research current issues impacting coal mining in Kentucky by reviewing newspaper articles and summarizing problems.

3. Meet as needed to prepare a group report on your subject area and a 10 to 15 minute skit re-enacting the events and assuming the identities of the key actors. Have all group members participate and assume the identity of a person either fictional or nonfictional (dress as appropriate).
4. Video tape the skit and send it to your local cable television or invite other classes to view the re-enactments. Consider making it into a school play.

Other Activities:

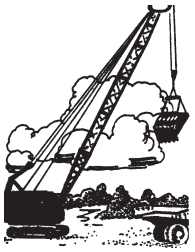
1. Request a list of all sites and companies with active mining permits for both deep mining and strip (surface) mining in your county from the Kentucky Department of Surface Mining Reclamation and Enforcement, #2 Hudson Hollow, Frankfort, Kentucky 40601 or call 502-564-6940. Map these sites on a topographical or road map of your county. Request to go along on a mine inspection.
2. Clip articles on coal mining issues and post on bulletin board by differing perspectives (industry, environmental group, government) and discuss periodically. Select a current issue, develop a class position on it, and write a letter to the appropriate legislative, executive, or judicial agency to voice your opinions.
3. Identify someone in your community who is trying to get a law enacted or changed and ask them to make a presentation to the class.

References/Additional Materials:

1. Kentucky Legislative Research Commission can provide more information on how laws are passed. Write to the Legislative Research Commission, State Capitol, Frankfort, KY 40601, or call 502-564-8100.
2. Kentucky Department for Surface Mining Reclamation and Enforcement can provide information on coal mining regulatory programs and the state's role in carrying them out. Write the Department at #2 Hudson Hollow, Frankfort, KY 40601 or call 502-564-6940.
3. The Kentucky Resources Council, a nonprofit citizens environmental group, may be able to provide additional historical coal mining information or sources. Contact: Tom FitzGerald, P.O. Box 1070, Frankfort, KY 40602.
4. The Kentucky Coal Association has long been involved in coal mining issues in Kentucky. Contact the association at 340 South Broadway, Lexington, KY 40508.
5. Kentuckians for the Commonwealth is an organization of local community groups involved in grassroots democracy projects including coal mining issues. Contact them at P.O. Box 864, Prestonsburg, KY 41653, 606-886-0043.
6. Kentucky Local Governance Project seeks to involve Kentuckians more fully in the democratic process. Contact the office at 311 Wilkinson St., Frankfort, KY 40601.
7. Appalshop in Whitesburg has film documentaries on Appalachia's culture and environment. One film documents the lives of coal mining women. Contact Appalshop at 306 Madison St. Whitesburg KY 41858, 606-633-0108.

Activity 2. Coal Mining Regulation in Kentucky

Worksheet #1



More Than 3,000 Coal Mines Active in Kentucky

While coal mining has been regulated to some degree in Kentucky since 1966, it wasn't until Congress passed the Surface Mining Control and Reclamation Act in 1977 (SMCRA) that coal mining was addressed nationwide. Kentucky obtained approval in 1982 to carry out the federal surface mining program. The Kentucky Department for Surface Mining Reclamation and Enforcement (DSMRE) has the authority to carry out the provisions of the law to ensure coal mining is properly done and the sites are reclaimed.

Before a site can be mined for coal the operator must obtain a permit from DSMRE. The permit process is one tool used to control coal mining and to ensure proper reclamation of mine sites. The development of the permit application requires the applicant to collect information about the site including its geology and water and land conditions. Based on this information, the applicant must design a mining and reclamation plan to minimize environmental impacts and restore the affected land back to a productive level once mining is complete. During the permit review process, DSMRE is required to evaluate the application and make a determination that mining will be conducted in a manner which complies with all regulations and that the reclamation plan is achievable.

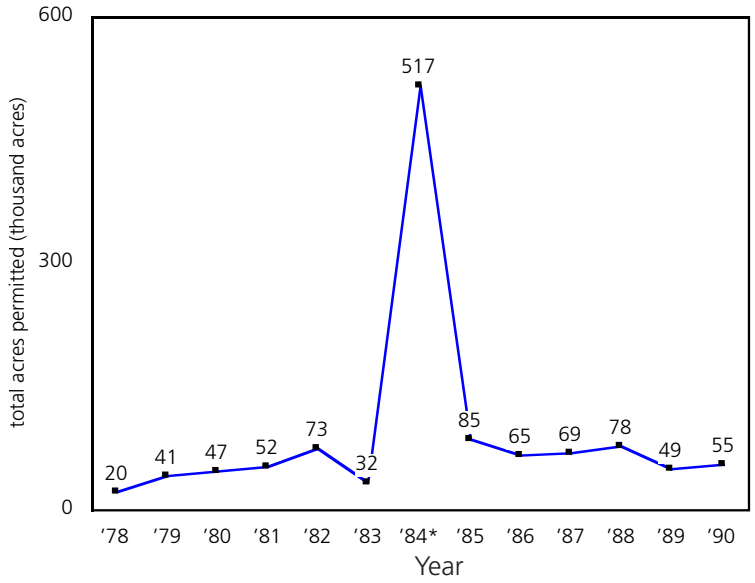
Since 1978, thousands of permits have been issued for coal mining in Kentucky. Currently there are about 4,174 active permits which include the following:

- ◆2,006 surface mines
- ◆1,449 underground mines
- ◆466 coal preparation plants
- ◆146 two–acre mine sites
- ◆107 associated facilities

Since 1978, 1.18 million acres of land have been included in thousands of surface, underground, or other mine-related permits, although all the land was not actually mined (Figure 1). Nearly 75% of the acreage disturbed by coal mining was located in Eastern Kentucky (Figure 2).

Figure 1

Acres Permitted for Coal Mining in Kentucky

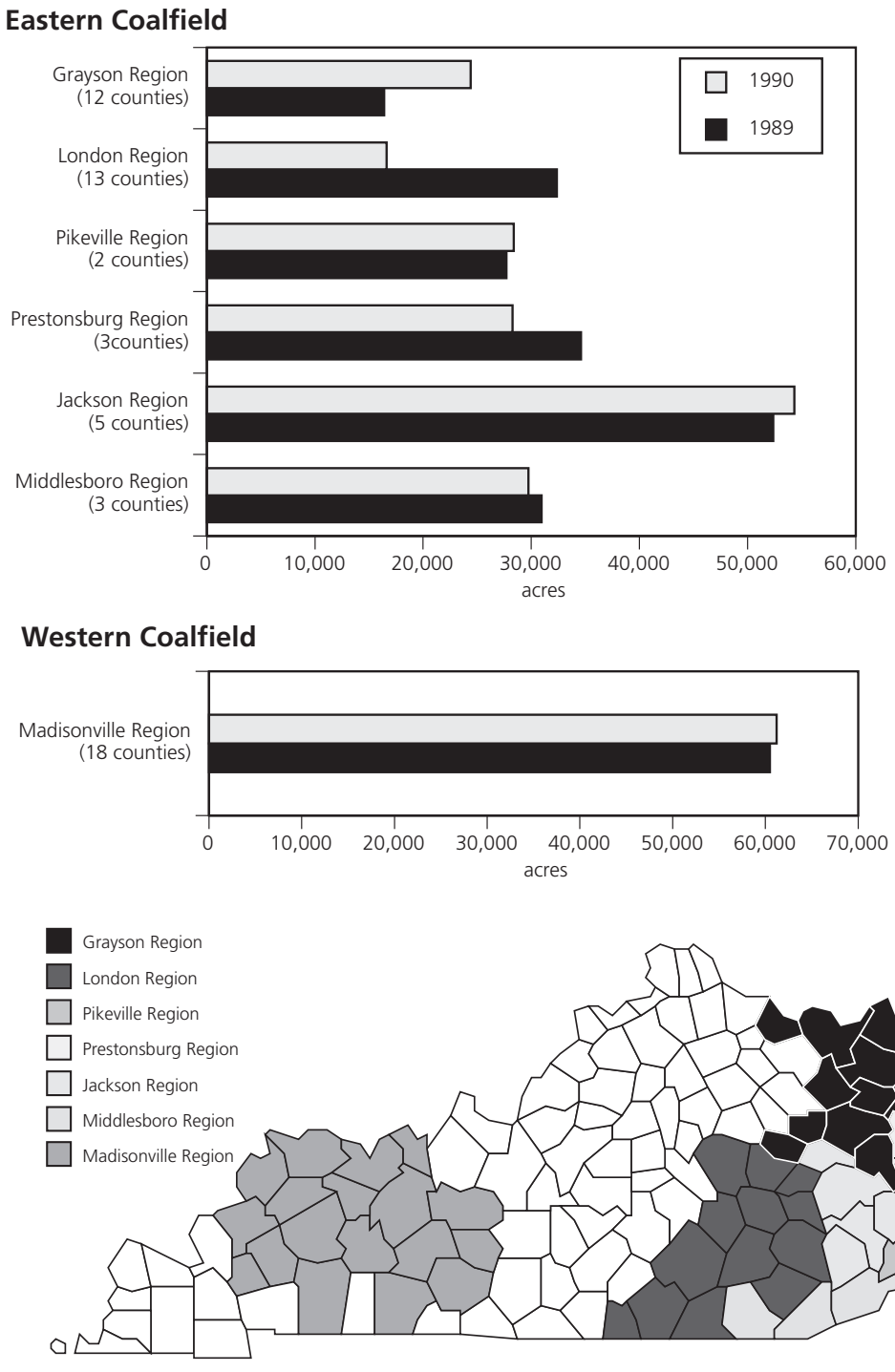


**1984 data includes interim operations that were re-permitted, making the total high.*
Source: Kentucky Department for Surface Mining Reclamation and Enforcement, 1991

Worksheet #1 continued

Figure 2

Acreage Disturbed by Coal Mining in Kentucky by Region



Source: Kentucky Department for Surface Mining Reclamation and Enforcement, 1991

Worksheet #1 continued

Enforcement At Mine Sites Leads to Improvements

Enforcement of the state's surface mining rules and regulations has led to improvements at mine sites. In 1991, 61.5% of Kentucky's mine operations were in full compliance with all permit conditions and state regulations (Figure 3).

One reason for these improvements was the addition of $13.5 million of federal money into Kentucky's regulatory program. These funds came from the settlement of a lawsuit filed by the National Wildlife Federation and the Kentucky Resources Council which charged that the state was not adequately enforcing surface mining laws.

Kentucky used the money to develop a program which routinely inspects and photographs all active coal mines from the air. Funds were also used to hire and train additional inspectors to police mine sites and to add more attorneys to pursue legal actions against violators.

Additionally, DSMRE improved its system to provide for better tracking of inspection and enforcement activities and to identify operators who have not corrected violations or have unpaid fines. This system is used to block operators from getting any new permits until past problems are corrected.

Citizens may request that inspections be conducted at mine sites to determine if violations are occurring. In 1990, 1,464 citizens requested inspections, primarily in Eastern Kentucky. Approximately 70% of these complaints alleged blasting damage to homes or water well supplies.

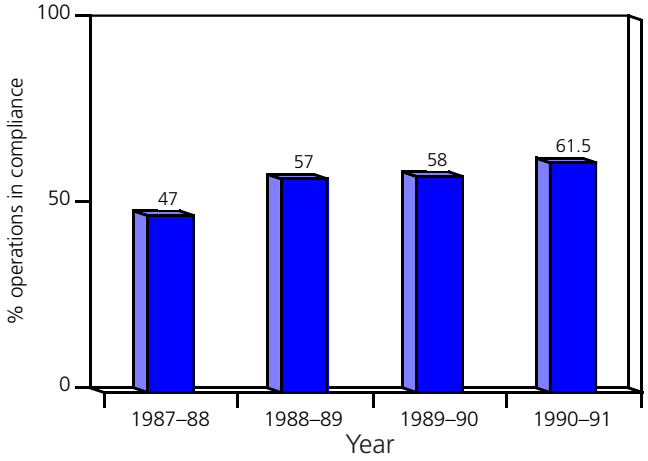
State Still Struggles With Reclaiming Abandoned Mine Sites

Since 1982, 10,000 of the 100,000 acres of abandoned mine land in Kentucky have been reclaimed (Figure 4).

Funds used to reclaim the 10,000 acres of old abandoned sites that were mined prior to 1977 are provided through a federal surcharge or tax on coal production.

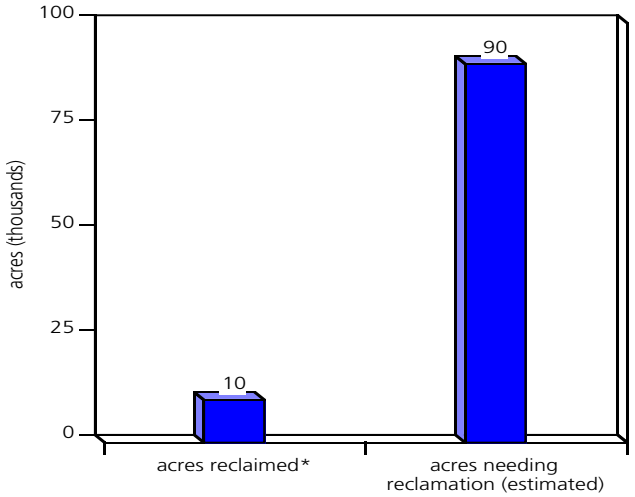
Since 1977, $2.5 billion has been collected under this national program and reallocated back to the states to reclaim abandoned sites. Kentucky has paid $298 million into the fund since 1982 and has received $196 million, a return of 65%. Another $38 million in funds was spent by the federal government to address mine emergencies in Kentucky such as landslides, fires, and land subsidence caused by collapsing underground mines.

Figure 3
Compliance of Kentucky Coal Mining Operations



Note: based on fiscal years (July-June)
Source: U.S. Office of Surface Mining, Annual Reports

Figure 4
Reclamation of Abandoned Mine Lands in Kentucky (1982–1990)



**Projects not reflected in above acreage:*

- *14 waterlines completed*
- *4 waterlines under construction*
- *3 stream restorations*
- *1 acid mine drainage project*
- *1 stabilization project*
- *38 maintenance projects*
- *1 mine fire-related subsidence and fencing*
- *Hundreds of mine portal closures*

Source: Kentucky Department of Surface Mining Reclamation and Enforcement, 1991

Worksheet #1 continued

Abandoned Mines Threaten Environment, Thousands of Acres Need Reclamation

Kentucky still has an estimated 90,000 acres of mine land to reclaim. These sites were mined before the 1977 law required mined lands to be reclaimed with vegetation and other safeguards to protect the public and the environment.

Many of these old sites have degraded the environment, especially water quality, by leaking pollutants into local waterways. Another option being considered to reclaim old abandoned mine sites is "re-mining." Re-mining involves the mining of old abandoned minesites to recover the remaining coal. Once the coal is removed the site would then be reclaimed. It is not known how much coal is available at old mine sites, although the coal industry has expressed an interest in recovering coal from these areas.

The single most significant issue affecting re-mining is a coal company's ability to fully address the pollution problems at an abandoned mine site. Many of the sites have significant water contamination problems. The coal industry has been reluctant to re-mine abandoned mine sites due to the poor condition of these areas and the ability to meet state environmental requirements once the site is reclaimed.

Changes in federal law and regulatory standards may be needed to encourage re-mining. In the meantime, abandoned mine lands will continue to pollute our environment. Due to the high costs to reclaim these sites it will take many years to address them.

Questions ?

1. What is the total coal mine acreage permitted in Kentucky since 1978? What do you think influences the coal production rates?
2. Which region of the state had the most disturbed coal mining acreage in 1990? Which had the least? Calculate the percent change of acreage disturbed by coal mining for each region of the state between 1989 and 1990.
3. Is compliance with coal mining regulations improving or getting worse? Support your answer with facts and why you think this is the case.
4. How many acres of abandoned mine lands have been reclaimed in Kentucky? What percentage is this to the total acres needing to be reclaimed?
5. Based on the $165 million dollars received by the state to reclaim abandoned mine sites, calculate the cost per acre of the sites reclaimed in Kentucky.
6. What do you think are the environmental impacts from coal mining? Suggest ways we can better control these problems.

What You can Do. . .

1. Report any water pollution incident, such as discolored water or dead fish in a stream, to the Kentucky Division of Water, 14 Reilly Rd., Frankfort, KY 40601, 502-564-3410.
2. If you suspect a pollution problem is being caused by a coal mine, you can request the state to conduct an inspection of the site. Contact the Kentucky Department of Surface Mining Reclamation and Enforcement, #2 Hudson Hollow, Frankfort, KY 40601, 502-564-6940.

Activity 3. Environmental Costs Versus Benefits of Coal Mining

Instruction Sheet

DO YOU KNOW. . .

- Why some communities have banned coal mining in certain areas?
- How Kentucky can have both a clean environment and strong economy?

Coal Mining Provides Economic Benefits, But There are Costs

Coal has been fondly called Kentucky's "ace in the hole." Coal mining is among the state's leading industries employing 31,500 Kentuckians. It provides millions of dollars in revenue to finance local and state government programs and projects. And the burning of coal generates 94% of Kentucky's electricity.

But thousands of acres of abandoned mine lands, runoff from poorly reclaimed mines, blasting, and other coal mining activities are impacting many miles of streams and rivers and affecting several community drinking water supplies. Last year the state received 1,464 citizen complaints regarding mining activities. Pollutants from burning coal are also linked to acid rain, global warming, and other environmental problems.

In a few cases, some communities have decided the environmental risks of coal mining far outweighed the economic benefits. For example, in Bell County, the community petitioned to have a 2,900 acre watershed surrounding a lake designated as "unsuitable for coal mining" to protect its local drinking water supply. The community determined that protecting its water supply far outweighed the economic benefits (jobs, local revenues, etc.) of mining the area.

A community can petition to have lands declared "unsuitable" for mining to protect important resources. To date, two out of 15 petitions filed in Kentucky to designate an area unsuitable for mining have been approved by the state. The other petition approved involved 10,500 acres at the University of Kentucky's Robinson Forest, a research forest in Breathitt and Knott counties.

In most cases, the public must rely upon the government to minimize the environmental impacts of coal mining. Taxpayer costs of regulating coal mining in Kentucky nearly tripled over the last 11 years, from $3.9 million in 1980 to $11 million in 1991.

Weighing environmental costs versus economic benefits often pit jobs against the environment. Such is the case in the proposal to mine under Lilley Cornett Woods, an old-growth forest in Eastern Kentucky. We all have our own opinions regarding whether the benefits outweigh the costs of a particular development activity. But it is important that we consider all views so we can work together to resolve environmental conflicts. Sometimes compromises can be reached, other times they cannot. But it is important to try to address these concerns in a matter that will benefit both the environment and our economy.

Looking for New Ways to Promote a Sound Economy and Healthy Environment

The 1992 Earth Summit held last June in Rio de Janerio, Brazil, focused the world's attention on the need to ensure the use of resources and the environment today does not damage prospects for their use by future generations. This concept is known as "sustainable development."

Many are concerned we are using up some resources too quickly and altering the Earth's natural balance in the process. An good example of unsustainable development is the destruction of the rainforests in South America. The forests, which provided a stable economy for local people for hundreds of years, are being destroyed quickly for the short-term economic gain of a relatively few. Careful planning regarding how resources are used and preserved can offset many of the negative impacts to people and the environment, according to proponents of sustainable development policies.

The Earth Summit brought 157 countries together to find common solutions to the world's growing environmental problems. There is growing support for sustainable development and the need for all of us to work together to preserve our economy and environment. President Clinton has appointed a Sustainable Development Council to further explore ways we can sustain our economy and environment. There has also been a movement by some large U.S. corporations to strongly weigh environmental factors when making economic decisions in order to eliminate or minimize long-term damage to the environment.

A conference was hosted by Kentucky in May 1933 as a follow-up to the Earth Summit to explore ways

Instructions continued

states could promote sustainable development. Students from around the U.S. participated in the conference, expressing their concerns and offering suggestions for ensuring that economic decisions affecting our environment fully consider the impact on future generations.

Purpose:

Economic and environmental conflicts are increasing in Kentucky and nationwide. Many of these conflicts end up in court where they may take many years to resolve. However, in some cases people come together in an effort to resolve the problem in a manner acceptable to all. This activity will involve you in a conflict regarding coal mining in the Lilley Cornett Woods. You will view both sides of the issue, and consider ways to work together to resolve the problem and understand the opinions of others.

Procedure:

Part I - Understanding Environmental/Economic Conflicts

This learning activity is an open class discussion.

The scenario - The South East Coal company wants to mine Lilley Cornett Woods, a 500-acre old-growth forest.

1. Obtain Worksheet #1. Take it home and review it. List the reasons why you think the company should be allowed to mine the forest as well as the reasons not to mine the forest.
2. As a class, negotiate the rules of the discussion on this issue. The rules should be agreed upon by all and posted in an area where all students can see them. Among the rules to consider are:
    A. Everyone participates.
    B. No individual should dominate.
    C. All viewpoints are considered and respected.
    D. Maintain an open atmosphere for discussion.
    E. Listen to each other.
3. State the goal of the discussion which may include:
    A. Identify what the proponents and critics say about this issue.
    B. Make a good case for viewpoints you dislike, critique your favorite viewpoints, and consider new ideas.
    C. Understand others have reason for their ideas.
    D. Realize knowledge is not complete until you understand why others feel the way they do about the issue.
    E. Consider the underlying values of the issue (i.e. what values influence our viewpoints and how they impact business and economic decisions).
4. Choose a moderator and someone to record your comments. These students should be neutral and will lead discussion #1.
5. Discussion #1-"Mining should be allowed in Lilley Cornett Woods."

Discuss all the reasons why mining should be allowed in the forest and have the recorder list these on a blackboard or flip chart. Everyone should participate even if you do not believe this should be allowed. The moderator will ask you to also clarify your reason based on your beliefs or values. Be sure to consider broader issues such as free enterprise, coal versus imported oil, national security, energy production, etc.

6. Discussion #2 -"Mining should not be allowed in Lilley Cornett Woods."

Choose another moderator and recorder to lead the discussion. Conduct this in the same manner as your earlier discussion. Remember to consider broader issues such as whether you believe governmental regulations can adequately protect the forest, natural heritage; impacts to tourism; threatened and endangered species as a source of medicine; ecological diversity, etc. At all times the moderator should be neutral.

7. After you have completed the discussion review with your teacher the pros and cons of mining the forest, referring back to the reasons listed on the blackboard and flip chart. Try to identify how "values" play a role in some of the reasons listed to mine or not mine the forest and compare the values on both sides of the issues. Discuss at what point public and environmental values outweigh economic benefits.
8. Determine if there is an acceptable way to resolve this conflict. This must be agreed to by all to be acceptable.

Instructions continued

9. Submit your agreed upon recommendation to the Commissioner, Kentucky Department for Natural Resources and Environmental Protection, 107 Mero St., Frankfort, KY 40601, for his consideration.

Part II - Exploring Ways to Promote Jobs and a Clean Environment

1. Research the concept of "sustainable development." Sustainable development is defined as the process of developing economically while ensuring our resources are not depleted and growth does not impair the ability of future generations to have a healthy environment. Review how Kentucky can promote a sustainable economy.
2. Discuss your findings in class and ways you can promote a sustainable world.

Other Activities:

Clip newspaper articles about issues that foster the "environment versus jobs" mindset. Post these articles on a bulletin board. Review and discuss these periodically.

References/Additional Resources:

1. You can find more about sustainable development by contacting the United Nations, Department of Public Information, 485 Fifth Ave., NY, NY 10017, 212-963-7704.
2. To obtain a copy of the "Youth Environmentally Aware" Conference in Kentucky which reviewed such issues as sustainable development and promoting environmental awareness contact: Youth Environmentally Aware c/o JCPs Gheens Academy, 4425 Preston Hwy., Louisville, KY 40213, 502-473-3295.
3. This discussion process was adapted from the "Community Issue Gatherings Appalachian Civic Leadership Project." For additional information about how to conduct such a discussion contact Ron Hustedde, Public Policy Coordinator, University of Kentucky, Sociology, 500 Garrigus Bldg., Lexington, KY 40546-3471, 606-257-3186.

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Activity 3. Environmental Costs Versus Benefits of Mining

Worksheet #1

Scientists Concerned Threat Lurks under "Lilley's Woods"

By Andy Mead
Herald Leader Staff Writer
April 5 1993

Skyline - The tulip poplar is 40 inches thick, maybe three centuries old and seems tall enough to touch the Letcher County sky.

The human standing at the base appears tiny beside the giant.

"Poplar gets to be a real big tree," Mike Brotzge says. "Used to anyway. People don't leave them alone anymore."

This particular poplar is in Lilley Cornett Woods, the only protected stand of old-growth forest in Eastern Kentucky.

It has been left alone - escaping the saws that felled 7 million acres of its neighbors.

But now scientists are worried about the threat from below: underground coal mining that could upset a balance nature has maintained for millions of years.

Coal mines could change drainage patterns, they say, robbing roots of moisture and threatening trees that have survived centuries of storms, fires, and droughts.

One coal company already has been granted a state permit to mine beneath the forest. Another company has applied for one.

Living Museum

Lilley Cornett was a coal miner who toiled for 10 cents an hour and saved his money to save the land.

Soon after World War I, he bought the first of five tracts that would eventually become the 550-acre preserve that bears his name.

The big old trees in what was called "Lilley's Woods" became more and more valuable as other forests across the region were leveled.

Cornett refused many offers to sell the timber from his land, allowing the cutting only of chestnut tress that were dead or dying of a blight that swept through in the 1930s and 1940s.

His children kept up the tradition for years after his death, then sold the forest to the state in 1969.

The Cornett family did not own the coal beneath the land. It remained in the hands of coal companies when the land went to the state.

The forest is what scientists call mixed mesophytic.

It is among the oldest forests in the world. Individual trees live only a few hundred years, but the forest has been developing for millions of years, creating unequaled biological diversity.

Although 80 percent of Eastern Kentucky still is forested, it is almost all second- or third-growth forest.

Only Lilley Cornett Woods and Blanton Forest, a recently discovered 2,000-acre Harlan County tract that is in private hands, remain in anything near their "pre-civilization" condition.

Nothing has been left pristine enough to be called virgin forest. And only a part of Lilley Cornett Woods - estimates vary from 100 to 250 acres - are untouched enough to qualify as old growth.

Lilley Cornett Woods is administered by Eastern Kentucky University as an Appalachian Ecological Research Station. It is an outdoor laboratory for the study of the way forests ought to be.

How fast do trees grow? William Martin, Kentucky's commissioner of natural resources, marked off plots of one-fifth acre, 135 plots in all, in 1971. He measured and recorded the species of every tree in every plot. The procedure was repeated in 1981 and 1991.

How fast does rain water drain from undisturbed land? A small temporary weir, or dam, has been built to help measure water in a mountainside creek.

The forest has been used for numerous other scientific studies, doctoral dissertations and masters' theses, said Jon Maki, acting director of EKU's Division of Natural Areas.

But mostly it is left alone.

When one the great trees falls, it is left unless it falls across one the woods' two trails. Then only the part blocking the trail is removed.

If a human runs across a rattlesnake in Lilley Cornett Woods, the human gives the snake a wide berth. Killing snakes is taboo, as is knocking down a hornets' nest.

A few years ago, a researcher who wanted to

Worksheet #1 continued

collect fallen leaves was required to fill out a detailed permit.

Spring beauties

Mike Brotzge knows Lilley's Woods. He has been superintendent for nearly 19 years.

He quickly spotted the bloodroot and spring beauties beginning to bloom last week. They are running a little behind, he said, because of the big March snow.

Soon the woods will be filled with wildflowers; there are 530 species of flowering plants.

Brotzge passed the big trees and instantly knows them by their bark.

There are hemlocks in the hollows, giving way to poplars and beeches, then oaks and hickories.

Some of the oldest white oaks, massive, slow-growing trees, might be 600 years old, he says.

"Think about the storms they've seen," he says. "The Indians and all kinds of things."

A pileated woodpecker swoops overhead, its rising and falling cuk-cuk-cuk-cuk-cuk call sounding like something out of a Tarzan movie.

The woods - off limits to hunters - is teeming with wildlife.

Turkeys, deer, rabbits, possum, hawks, warblers, owls.

And probably bears. No one has seen a black bear in Lilley Cornett Woods, but it wouldn't surprise Brotzge if anyone did.

With warm weather, people will become more common in the woods. About 1,5000 visit each year.

Boy Scouts, school groups - they come from all over. Most come from urban areas: Lexington, Louisville, Cincinnati.

All must be escorted by guides.

The trails are so natural as to be nearly invisible in places.

During a hike through the woods on the only nice day last week, not a single aluminum can, gum wrapper or cigarette butt was seen - truly a rarity in a Kentucky forest.

Money or Mining

Lake Coal Co. was granted a permit to mine under Lilley Cornett Woods more than a year ago.

EKU has challenged the permit and asked for a hearing to air their protest. No mining has taken place.

Lake has since been acquired by Enterprise Coal Co. Jim McComb, the company's chief engineer, said last week that "we don't really have any plans at present," but declined to go into detail.

When asked whether Enterprise would be willing to sell its right to mine the land, McComb said he could not comment on what the company would do "under certain situations."

Another permit has been requested by South East Coal. That permit would allow mining under Big Everidge Hollow, the least disturbed part of the woods.

At an informal permit conference held in Frankfort last month, South East president Harry LaViers Jr. did not try to counter the arguments of EKU scientists who opposed the permit on environmental grounds.

But he said his company had a right to mine. He said he wants either a permit or to be paid for not mining.

"We are not saying this property should or should not be mined," LaViers said.

If denied a permit, he said, South East will go to court and ask to be compensated for the profit it would make if mining took place.

Tom FitzGerald, an environmental attorney from the Kentucky Resources Council, suggested that the state try to get federal money to buy out the coal companies, ending for good the threat to the woods.

A string of scientists and environmentalists testified about the threat to a hilly plot of land that has been relatively undisturbed by man.

"You can find coal in other places," said Mark Schimmoeller of Kentucky Heartwood. "But you cannot find old-growth forest."

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South East Coal conservation forces clash over forest

By Andy Mead
Herald Leader Staff Writer
March 25, 1993

The fate of Lilley Cornett Woods, the largest protected patch of old growth forest in Eastern Kentucky, will be debated at a mining permit conference today.

South East Coal Co. has applied for a permit to mine coal beneath the Letcher County forest, much of which has escaped human disturbance.

South East President Harry LaViers Jr. says the issue is not whether an underground mine would harm the ancient trees above.

The issue, he says, is whether the government can take private property - in this case mineral rights - without paying the owner.

Worksheet #1 continued

"We're not a bunch of lawless people out here trying to do something wrong, we are trying to protect our interest," LaViers said yesterday.

But conservation groups and scientists from Eastern Kentucky University are expected to argue that underground mines could upset the natural balance, causing surface subsidence and robbing water from tree roots.

The permit conference is an informal meeting to discuss the merits of a mining permit application.

LaViers said he does not dispute that the state can deny him a permit.

He said he slightly favors being allowed to mine the coal instead of being paid for the profits he would make from mining. That is because mining would create jobs for about 75 people for three or four years, he said.

The 1977 Surface Mining Act prohibits surface mining within 300 feet of a public park. Fred Kirchoff, director the Division of Permits, said there is debate within the Natural Resources and Environmental Protection Cabinet about whether that includes disturbances caused by deep mines.

LaViers said recent court decisions, including a U.S. Supreme Court ruling last year, clearly support his argument that he is entitled to a permit or compensation.

He said the compensation would be the profit possible from mining in 1977, plus interest - "several million dollars."

"The issue is that they can't have it both ways," he said. "They either go to fish or cut bait."

Tom FitzGerald of the Kentucky Resources Council argues, however, that the court rulings are not as clear-cut as LaViers says.

He plans to attend the conference to encourage the state to deny the permit.

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